



**U.S. Department of Energy**  
**Office of River Protection**

**P.O. Box 450  
Richland, Washington 99352**

01-OSR-0311

Mr. Ron F. Naventi, Project Manager  
Bechtel National, Inc.  
3000 George Washington Way  
Richland, Washington 99352

Dear Mr. Naventi:

**CONTRACT NO. DE-AC27-01RV14136 – OFFICE OF SAFETY REGULATION PARTIAL  
APPROVAL OF BECHTEL NATIONAL, INC (BNI) AUTHORIZATION BASIS CHANGE  
NOTICE, ABCN-24590-01-00006**

Reference: BNI letter from A. R. Veirup to M. K. Barrett, ORP, "Revision 0 of Authorization  
Basis Change Notice ABCN-24590-01-00006 (ABAR-W375-00-00013)"CCN:  
021275, dated July 16, 2001.

On the basis of the enclosed safety evaluation report, the U.S. Department of Energy, Office of River Protection, Office of Safety Regulation (OSR) partially approves the referenced Authorization Basis Change Notice, (ABCN), ABCN-24590-01-00006, to the Safety Requirements Document (SRD) and the Integrated Safety Management Plan (ISMP) for the River Protection Project-Waste Treatment Plant (RPP-WTP). The partial approval is in response to your ABCN submittal dated July 16, 2001. The OSR approved all proposed changes contained in your submittal except for the proposed change to SRD-SC 1.0-1 involving deletion of the ISMP as an implementing standard. The OSR did not approve this proposed change because the request did not adequately support the assertion that other Safety Criteria (SCs) provide equivalent standards to those provided by the proposed deleted standard. The ABCN was noticed on the OSR website on July 23, 2001, and public comments were solicited. No public comments were received within the two-week comment period.

The approved portion of the ABCN revises several related sections of the SRD and ISMP. The revisions include: (1) removal of references to 29 CFR 1910.119 and/or 40 CFR 68 as a regulatory basis in the SRD; (2) replacement or deletion of certain implementing standards (3) revision of the definition of Safety Design Class as it pertains to chemical releases; (4) revision of the SRD to require chemical hazards be included in the Process Hazards Analysis (PHA); (5) modification of the update frequency for the PHA and Hazard Analysis Report (HAR) from once every five years to annual; (6) revision of the seismic design criteria in the SRD for Systems, Structures and Components (SSC) designated Safety Design Class from Seismic Category-I and II (SC) to SC-III; (7) revision of the scope of the natural phenomena hazards specified in the SRD to include chemical hazards; (8) revision of the chemical concentration limits specified in the SRD for control room habitability; (9) inclusion of chemical hazards in the definition of unreviewed safety question (USQ) specified in the SRD and ISMP; (10) revision of the scope of the SRD requirements for chemical hazard assessments to be more specific; (11) deletion of the SRD

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requirement for a risk management plan, and (12) update of the SRD and ISMP references to applicable, revised SRD criteria. If BNI later determines that threshold quantities of chemicals will be on site, then the action requirements of 40 CFR 68 and 29 CFR 1910.119 concerning such chemicals must be added to the SRD.

As part of the ABCN implementing process, please submit within 14 days of receipt of this letter the revised pages of the SRD and ISMP and the revision page for each document identifying all revisions to date. This change is effective immediately and shall be fully implemented within 30 days, i.e., the provisions of the change may be used immediately; within 30 days, controlled copies of the SRD and ISMP and subordinate documents must be modified to reflect the associated change .

If you have any questions please contact Dr. Walter Pasciak, OSR, (509) 373-9189. Nothing in this letter should be construed as changing the Contract, DE-AC27-01RV14136. If, in my capacity as the Safety Regulation Official, I provide any direction that your company believes exceeds my authority or constitutes a change to the Contract, you will immediately notify the Contracting Officer and request clarification prior to complying with the direction.

Sincerely,

Robert C. Barr  
Safety Regulation Official  
Office of Safety Regulation

OSR:WJP

Attachment

**Safety Evaluation Report (SER)  
of Proposed Authorization Basis Change Notice  
ABCN-24590-01-00006  
to the Safety Requirements Document and the  
Integrated Safety Management Plan  
for the River Protection Project-Waste Treatment Plant  
by the Office of Safety Regulation**

## **1.0 INTRODUCTION**

The River Protection Project Waste Treatment Plant (RPP-WTP) authorization basis is the composite of information provided by a Contractor in response to radiological, nuclear, and process safety requirements that is the basis on which the Office of Safety Regulation (OSR) Safety Regulation Official grants permission to perform regulated activities. The authorization basis includes that information requested by the Contractor for inclusion in the authorization basis and subsequently accepted by the OSR. The authorization basis for the RPP-WTP includes the Safety Requirements Document (SRD) and the Integrated Safety Management Plan (ISMP). The SRD contains the approved set of radiological, nuclear and process safety standards and requirements, which if implemented, provide adequate protection of workers, the public, and the environment against the hazards associated with the operation of the facility. The ISMP defines a set of integrated activities that is directed toward the management or control of radiological, nuclear, and process hazards such that adequate protection is provided to workers, the public, and the environment. By letter dated July 16, 2001,<sup>1</sup> Bechtel National, Inc., (Contractor) submitted a proposed amendment to the SRD and ISMP. This SER documents the OSR evaluation of the changes proposed by the Contractor in the area of chemical process safety management. The Contractor had submitted these changes earlier on April 24, 2000. The OSR responded to the request by letter dated July 28, 2000,<sup>2</sup> and disapproved the overall proposed ABAR, although portions of the proposed ABAR were considered acceptable at that time.

The amendment proposes changes to several related sections of the SRD and ISMP. The proposed revisions include: (1) removal of references to 29 CFR 1910.119 and/or 40 CFR 68 as a regulatory basis in the SRD; (2) replacement or deletion of certain implementing standards; (3) revision of the definition of Safety Design Class as it pertains to chemical releases; (4) revision of the SRD to require chemical hazards be included in the Preliminary Hazards Analysis (PHA); (5) modification of the update frequency for the PHA and Hazard Analysis Report (HAR) from once every five years to annual; (6) revision of the seismic design criteria in the SRD for SSCs designated Safety Design Class from SC-I/II to SC-III; (7) revision of the scope of the natural phenomena hazards specified in the SRD to include chemical hazards; (8) revision of the chemical concentration limits specified in the SRD for control room habitability; (9) inclusion of chemical hazards in the definition of unreviewed safety question (USQ) specified in the SRD and ISMP; (10) revision of the scope of the SRD requirements for chemical hazard assessment to be more specific; (11) deletion of the SRD requirement for a risk management plan, and (12) update of SRD and ISMP references to revised safety criteria.

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<sup>1</sup> BNI letter from A. R. Veirup to M. K. Barrett, ORP, "Revision 0 of Authorization Basis Change Notice ABCN-24590-01-00006 (ABAR-W375-00-00013)," CCN 021275, dated July 16, 2001.

<sup>2</sup> OSR letter from D. C. Gibbs to P. O. Strawbridge, BNFL, "Regulatory Unit (RU) disapproval of Authorization Basis Amendment Request ABAR-W375-00-00013, Revision 0, Changes to the process Safety Management (PSM) Program," 01-RU-0514, dated July 28, 2000.

## **2.0 BACKGROUND**

The ISMP and SRD describe the process for identifying hazards, developing control strategies, and selecting standards for the WTP. The process described in the ISMP and SRD was developed primarily for identifying radiological and chemical hazards and includes the development of safety criteria and design requirements that are based on the potential hazards. This proposed amendment refines the regulatory framework of the ISMP and SRD for chemical hazards.

Presently, the SRD requires conformance with ERPG-2 levels for workers and the public in designing the response of the facility to chemical accidents. A graded approach for the protection of persons from chemical accidents should apply more restrictive criteria for protection of the public than for the protection of co-located workers and facility workers. Likewise, criteria for protection of co-located workers should be more restrictive than the criteria for protection of facility workers. The ABCN proposes ERPG-3 concentrations as the appropriate exposure criteria protecting co-located workers from accidents involving airborne releases of hazardous process chemicals. ERPG-3 values (which are higher than the corresponding ERPG-2 values protecting the public, and are, therefore, less conservative) are the commonly accepted criteria for the protection of co-located workers potentially exposed to airborne chemicals at DOE sites, nation-wide. This change also establishes less restrictive criteria for protection of workers than the criteria for co-located workers. The criteria for workers is accidents causing in-patient hospitalization of at least 3 facility workers or at least a single fatality. This approach reflects a graded safety approach for the workers, co-located workers and the public for accidents involving chemical releases, and reflects the consensus chemical industrial safety approach.

Another change included in the proposed amendment deletes reference to certain OSHA and EPA regulations because the associated hazard was removed from the facility. Specifically, the RPP-WTP process required that anhydrous ammonia be stored onsite in quantities exceeding the thresholds of 29 CFR 1910.119 (OSHA's Process Safety Management Standard) and 40 CFR 68 (EPA's Risk Management Program) for action. Currently, the process provides for ammonia to be generated from urea. As a result, quantities of ammonia stored onsite are not expected to exceed the 29 CFR 1910.119 and 40 CFR 68 thresholds so there does not currently appear to be a need to conform to the actions required by these rules when the thresholds are exceeded. Because the design is subject to change, if the design is later determined to have threshold quantities of hazardous chemicals, BNI must revise the SRD to include safety criteria that reflect the action requirements of the rules in the SRD.

## **3.0 EVALUATION**

### **Changes to the SRD:**

Proposed changes to SRD-SC 1.0-1; 3.1-1, -2, -3, -5, -6, -7, and -8; 4.0-2; 4.5-23; 6.0-1 and -5; 7.1-1 and -2, 7.2-3 through -8, 7.3-7, -10 and -11; 7.6-2 and -4; 7.7-1, -2, and -3; 7.8-1, -2 and -5; 9.1-7; Delete 40 CFR 68 and/or 29 CFR 1910.119 as regulatory basis documents.

Evaluation (acceptable): The revision deleting references to 29 CFR 1910.119 and/or 40 CFR 68 is acceptable because RPP-WTP is not subject to the action requirements of OSHA's PSM Standard and EPA's Risk Management Program because the chemicals contained in the facility are not currently planned to exceed the threshold quantities listed in the rules based on the current design. Further, the SRD "Regulatory Basis" is informational text of a non-regulatory nature and not of significant concern to the OSR.

Proposed change to SRD-SC 1.0-1: Delete ISMP as an implementation standard.

Evaluation (unacceptable): Regarding deletion of ISMP references as implementing standards, in the previous review by the OSR it was stated that because other SCs commit the contractor to a program of acceptable management practices, technologies, procedures, and operations, the contractor could omit the ISMP as the implementing standards without a reduction in commitment. After further review, the basis for this conclusion is not apparent. Therefore, prior to approving this change, BNI must demonstrate that other SCs provide equivalent standards that the proposed deleted standards provide. If this demonstration can be made, deletion of the ISMP as an implementing standard would be acceptable for this SC.

Proposed change to SRD-SC 1.0-8 and 2.0-2: Revise the definition of Safety Design Class to include ERPG-3 concentrations for the co-located worker, and concentrations that could be expected to result in either a single worker fatality or require in-patient hospitalization of 3 workers or more. Definition of SDC for members of the public is corrected to include chemical concentration standards rather than chemical dose standards. Provide for use of TEEL concentrations where no ERPG has been published.

Evaluation (acceptable): The proposed revision of SC 1.0-8 and 2.0-2 substituting ERPG-2 concentration limits for the ERPG-2 dose standards for protection of the public is acceptable, and is more conservative because no time element for the exposure is implied. The ERPG-2 criterion is consistent with EPA's criterion for protection of the public and the environment for accident consequences calculations under 40 CFR 68's Risk Management Program. Likewise, the proposed revision of these SCs substituting the ERPG-3 concentration limit for the ERPG-2 dose standard for protection of co-located workers is acceptable because it is the commonly accepted criteria for the protection of co-located workers potentially exposed to airborne chemicals at DOE sites nation-wide. The proposed substitution of TEEL concentrations for the public and co-located workers in these SCs where no ERPG has been published is acceptable because it conforms with chemical industry standards. A definition of SDC for SSCs as those relied on to prevent a single fatality or the hospitalization of 3 or more workers from a process upset (or abnormal event) is acceptable to the OSR because it is consistent with 29 CFR 1904.8 "Reporting of fatality or multiple hospitalization incidents".

Proposed Change to SRD-SC 3.1-1: Revise the criterion to clarify that the process hazards analysis must consider both radiological and chemical hazards.

Evaluation (acceptable): The proposed revision to SC 3.1-1 to clarify that the process hazards analysis must consider both radiological and chemical hazards is acceptable because both types of hazards pose threats to the public and workers.

Proposed change to SRD-SC 3.1-2: Delete ISMP as an implementation standard. Revise text to require compilation of process safety information appropriate to the stage of design, to support the PHA.

Evaluation (acceptable): The SC contains the same wording as the implementing standard, therefore no implementing standard is necessary. The proposed change to the text of SC 3.1-2, requiring the compilation of process safety information appropriate to the stage of design, is acceptable because it conforms with the current ISMP, which recognizes that "Process technology information is developed as the design evolves."

Proposed Change to SRD-SC 3.1-1, -3, -4 and -5: Replace the ISMP implementing standard with Appendix A of the SRD as the implementing standard.

Evaluation (acceptable): The proposed revision to replace the ISMP Sections 3.1-1, -3, -4 and -5 as the implementing standard for SC 3.1-1, -3, -4 and -5 with Appendix A of the SRD is acceptable because Appendix A's description of the methodology of process hazards analysis essentially duplicates that provided in the ISMP.

Proposed Change to SRD-SC 3.1-7: Revise PHA update interval to once every year.

Evaluation (acceptable): The proposed change to update the PHA annually is acceptable because it potentially provides more accurate information in the PHA. The present updated frequency is "at least every five years after the completion of the initial process hazard analysis." The proposed change to SC 3.1-7 will reduce the interval between revisions of the PHA for process chemicals to that applicable for radiochemical processing, i.e., once a year.

Proposed change to SRD-SC 3.1-8: Delete ISMP as an implementation standard.

Evaluation (acceptable): Regarding deletion of ISMP references as implementing standards, this is acceptable for this SC because the referenced implementing standards provide no further explanation of the intent of the SC. The SC provides adequate clarity of its intent.

Proposed Change to SRD-SC 4.1-3: Revise the seismic standard to specify SC-III for non-radiological chemical systems.

Evaluation (acceptable): The proposed revision to SC 4.1-3 involving the seismic category for SSCs for handling (non-radiological) process chemicals is acceptable because the non-nuclear chemical industries have developed seismic design requirements to control their chemical hazards. These requirements are embodied in the Uniform Building Code, which is implemented at WTP as Seismic Category III.

Proposed Change to SRD-SC 4.1-4: Revise the SC addressing natural phenomena hazards to include chemical hazards.

Evaluation (acceptable): The proposed revision to SC 4.1-4 involving the seismic category for SSCs for handling (non-radiological) process chemicals is acceptable because the non-nuclear chemical industries have developed seismic design requirements to control their chemical

hazards. These requirements are embodied in the Uniform Building Code, which is implemented at WTP. This was determined to be acceptable in the earlier submittal (see footnote No.1, p.1).

Proposed Change to SRD-SC 4.3-7 Revised to require that worker exposure (control room habitability) not exceed chemical concentrations specified in 29 CFR 1910.120.

Evaluation (acceptable): The proposed revision to SC 4.3-7 is acceptable because 29 CFR 1910.120 references the permissible exposure limits in 29 CFR 1910 Subpart G “Occupational Health and Environmental Control” and Subpart Z “Toxic and Hazardous Substances,” which provide appropriate, OSHA-mandated, limits for worker exposure during accidents. The current SC 4.3-7 is inappropriate because it requires that “For occurrences and accidents involving chemical, i.e., non-radioactive, release, provisions shall be made such that the operator exposure does not exceed the worker exposure standards of Safety Criterion 2.0-2”, i.e., ERPG-2. The ERPG-2 value is inappropriate, and would not adequately protect operators in the control room during accidents involving chemical releases. This change was determined to be acceptable in the earlier evaluation (see footnote No.1, p.1).

Proposed Change to SRD-SC 7.4-1: Revise text to include chemical hazards in the USQ process.

Evaluation (acceptable): The proposed revision to SC 7.4-1 extends the requirements for unreviewed safety question (USQ) determinations to include potential accidents involving non-radiological chemicals. The proposed revision is conservative and provides more information, therefore it is acceptable.

Proposed Change to SRD-Section 9.3: Delete the entire section.

Evaluation (acceptable): The proposed deletion of Section 9.3 “Risk Management Plan” from the SRD is acceptable. The regulatory basis for this Section, 40 CFR 68, is currently inapplicable to the RPP-WTP because the chemicals contained in the facility are not expected to exceed the threshold quantities listed in the rule. Specifically, the RPP-WTP process required that anhydrous ammonia be stored onsite in quantities exceeding the thresholds of 40 CFR 68 (EPA’s Risk Management Program) for action. Currently, the process provides for ammonia to be generated from urea. As a result, quantities of ammonia stored onsite will not exceed the 40 CFR 68 threshold so there is no longer a need to conform to the actions required of this rule. Because the design is subject to change, if the design is later determined to have threshold quantities of hazardous chemicals, BNI must include the action requirements of the rules in the SRD Safety Criteria.

Proposed Change to SRD-Appendix A, Section 4.3.1: Revise to be more specific about the scope of the chemical hazards assessment.

Evaluation (acceptable): The proposed change is acceptable. The proposed revision to Appendix A’s Section 4.3.1 deletes the requirement that “(chemical) hazards shall be subject to the graded application of the Process Safety Management (PSM) rule”, and, instead, requires that “The assessment shall consider both the inherent hazard of the chemical itself, and the potential for the chemical hazard to initiate or exacerbate a radiological hazard.” This is an appropriate

change to make because the action requirements of 29 CFR 1910.119 do not apply because the RPP-WTP is not subject to the requirements of OSHA's PSM Standard since the chemicals contained in the facility do not exceed the threshold quantities listed in the rule. In addition, the proposed change modifies the definition of "chemical" to not be limited to "process chemicals", i.e., those chemicals comprising the usual, non-radioactive, process reagents, but could include decontamination chemicals (and any others) that might pose a threat to personnel and the integrity of process equipment. The proposed change is acceptable because it removes inappropriate references, broadens the definition of application and is conservative.

Proposed Change to SRD-Appendix A, Section 5.0: Revise discussion of ERPG concentrations.

Evaluation (acceptable): The second proposed change to Appendix A, Section 5.0 which substitutes the phrase "specified in SC 4.3-7" for "ERPG-2 limits" is acceptable, because SC 4.3-7 now proposes to reference 29 CFR 1910.120 for "emergency exposures" (which are no different from the permissible exposure limits applicable to normal operation.)

#### **Changes to the ISMP:**

Proposed Change to ISMP Sections 1.3.7 and 1.3.8: Replace references to ERPG-2 with SRD SC 2.0-2 and revise specification for control room habitability.

Evaluation (acceptable): The proposed revision referring to SRD SC 2.0-2 is acceptable, because the revision brings the ISMP into conformance with the corresponding proposed revisions to SC 2.0-2, which was evaluated as acceptable under the SRD portion of this evaluation.

Proposed Change to ISMP Section 1.3.10: Revise chemical safety SSCs from SCI/II criteria to SC III.

Evaluation (acceptable): The proposed revision to ISMP Section 1.3.10 is acceptable, because the proposed revision brings the ISMP into conformance with proposed revised SC 4.1-3 and SC 4.1-4 for non-radiological, chemical hazards, which was evaluated as acceptable under the SRD portion of this evaluation.

Proposed Change to ISMP Section 1.3.16, 1.3.17, 3.10, 5.0, 5.6.8, and 9.2: Delete reference to 29 CFR 1910.119 and or 40 CFR 68.

Evaluation (acceptable): The proposed revisions are acceptable because RPP-WTP is not currently expected to exceed the threshold quantities listed in 29 CFR 1910.119 and 40 CFR 68 that would trigger adherence to these standards.

Proposed Change to ISMP Section 3.16.4: Include chemical hazards in definition of USQ.

Evaluation (acceptable): The proposed revision to ISMP Section 3.16.4 is acceptable, because it brings the ISMP into conformance with the proposed revision to SC 7.4-1, which includes chemical hazards in the USQ process, which was evaluated as acceptable under the SRD portion of this evaluation.



Proposed Change to ISMP Section 5.6.2: Revise update requirements for PHA & HAR to annually.

Evaluation (acceptable): The proposed revision to ISMP Section 5.6.2 is acceptable because it brings the ISMP into conformance with the proposed revision to SC 3.1-7 concerning the interval between PHA updates (one year), which was evaluated as acceptable under the SRD portion of this evaluation.

Proposed Change to ISMP Section 9.2: Revise update requirements for the PHA and HAR.

Evaluation (acceptable): The proposed revisions to ISMP Section 9.2 are acceptable, because the revision requiring annual HAR updates brings the ISMP into conformance with SC 3.1-7, which was evaluated as acceptable under the SRD portion of this evaluation.

Proposed Change to ISMP Section 12.0: Revise definition of Safety Design Class.

Evaluation (acceptable): The proposed revision to the definition of Safety Design Class in ISMP Section 12.0 is acceptable, because it brings into conformance the definition of safety class which was evaluated as acceptable under the SRD portion of this evaluation.

#### **4.0 CONCLUSION**

Except for the proposed changes to the SRD-SC 1.0-1 involving deletion of the ISMP as implementing standards for this Safety Criteria, on the basis of the considerations described above, the OSR has concluded that there is reasonable assurance that the health and safety of the public and the workers will not be adversely affected by the proposed amendments, and that they comply with applicable laws, regulations, and RPP-WTP contractual requirements. Accordingly, except for the proposed changes to the SRD-SC 1.0-1 involving deletion of the ISMP as an implementing standard, based on this evaluation the OSR approves the amendments to the SRD and ISMP as proposed by ABCN-224590-01-0006.